

*Whey powder
production
in Greece*

By Vagn Westergaard

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In the eyes of many dairy operators and cheese makers, whey is simply a problem. Some 100 to 120 million tonnes of whey are produced worldwide each year during cheese production.

Whey disposal as an effluent is expensive, as the whey contains valuable constituents such as proteins, lactose and salts, it can be used in various food products. As in other European countries Greece is concerned about the environment. The country has a big traditional cheese production from milk from ewes, goats and cows. The resulting whey has not until recently been utilized industrially, but used as animal feedstock or disposed of otherwise, like f.inst. production of Mizithra cheese. Fluctuating milk supply, especially from ewes and goats due to seasonal variations, result in equally fluctuating production and supply of the fresh Mizithra cheese. Only the demand is steady.

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Hellenic Protein SA

Hellenic Protein SA, a new rapid developing company in Greece (*home page www.otenet.gr/hellenic-protein*) began its activities in the food sector in 1994. The purpose was to build whey plants in order to develop a non-existing local sector, and to utilize the whey and turn it from a problem into a profit. The company is mostly focused on production of whey protein products in new modern plants in Ioania (Epirus Protein SA) and in Karditsa (Central Protein SA). A third plant (Macedonia Protein SA) will be completed in the year 2001. The Hellenic Protein Product range is shown below.

The whey products have wide applications within the food industry i.e. meat industry, confectionery, baking industry, soft drinks, animal feedings, functional foods etc. On the local market Hellenic Pro-

tein SA sells direct to the food industry. On the International market they are using brokers. A big quantity of the products, however, is used by Hellenic Protein SA during the low season by dissolving the powder in order to produce fresh Mizithra cheese to cope with the steady demand for this product.

Whey consulting team

Against this background, the GEA companies joined forces and decided to adopt a completely new approach towards whey projects. GEA is now developing a comprehensive strategy for turning the whey problem into a business opportunity for the producers. This is done by offering the service of a WHEY CONSULTING TEAM. This team has skills in technology and can calculate the profitability of whey processing. Also attractive financing packages can be arranged.

Epirus Protein SA

The plant is located in Epirus, a region in the NW Greece with a long and great tradition in dairying. The EPIRUS PROTEIN SA factory was built in 1998 and includes the most recent technological innovations. Its functionality and flexibility during the pro-

EPIRUS PROTEIN SA factory – built to protect the environment.

The Hellenic Protein Product Range

WHEYPRO 10
WHEYPRO 20
WHEYPRO 35

WHEYPRO 65

LACTINA
ACILAC
PROLAC

Whey powder with min. 10% protein
Whey powder with min. 17% protein
Whey protein concentrate in powder with min. 33% protein
Whey protein concentrate in powder with min. 63% protein
Permeate powder
Whey powder from yoghurt prod.
Whey powder with min. 8% protein



duction makes it one of the most modern plants in Europe. The capacity is approximately 200,000 kg/day of whey.

The processing equipment has all been supplied by the GEA Group members.

Whey reception and pretreatment equipment was supplied by GEA Liquid Scandinavia, including Westfalia separators and an ultrafiltration plant.

The whey is received cooled and pasteurized directly from a nearby Feta cheese production factory, for processing into WPC with different protein content, permeate, or alternatively whey products.

The WPC is preconcentrated in a falling film evaporator, designed and supplied by Niro France (a company within the GEA Niro Group). The evaporator is designed with a very gentle pasteurizing system, which permits high temperature treatment for bacteria kill without destroying the functional properties of the WPC product. After preconcentration the WPC products are spray dried in a Niro COMPACT™ spray drying plant featuring an integrated fluid bed for second stage drying. The spray dryer design means that the WPC products are dried at very lenient conditions, which maintains the product's functional properties.

The resulting permeate from the ultrafiltration plant is concentrated in the same evaporator as was used for the WPC. However, as much higher concentration is possible, and required for this product, a finishing stage in the evaporator is used to obtain 55% TS or more before entering a flash cooler in order to reduce the temperature to 30°C before a precrystallization of the lactose takes place. This is done in crystallization tanks supplied by GEA Liquid Scandinavia.

After the precrystallization process, the product is dried in the same Niro COMPACT™ spray dryer as was used for the WPC products.

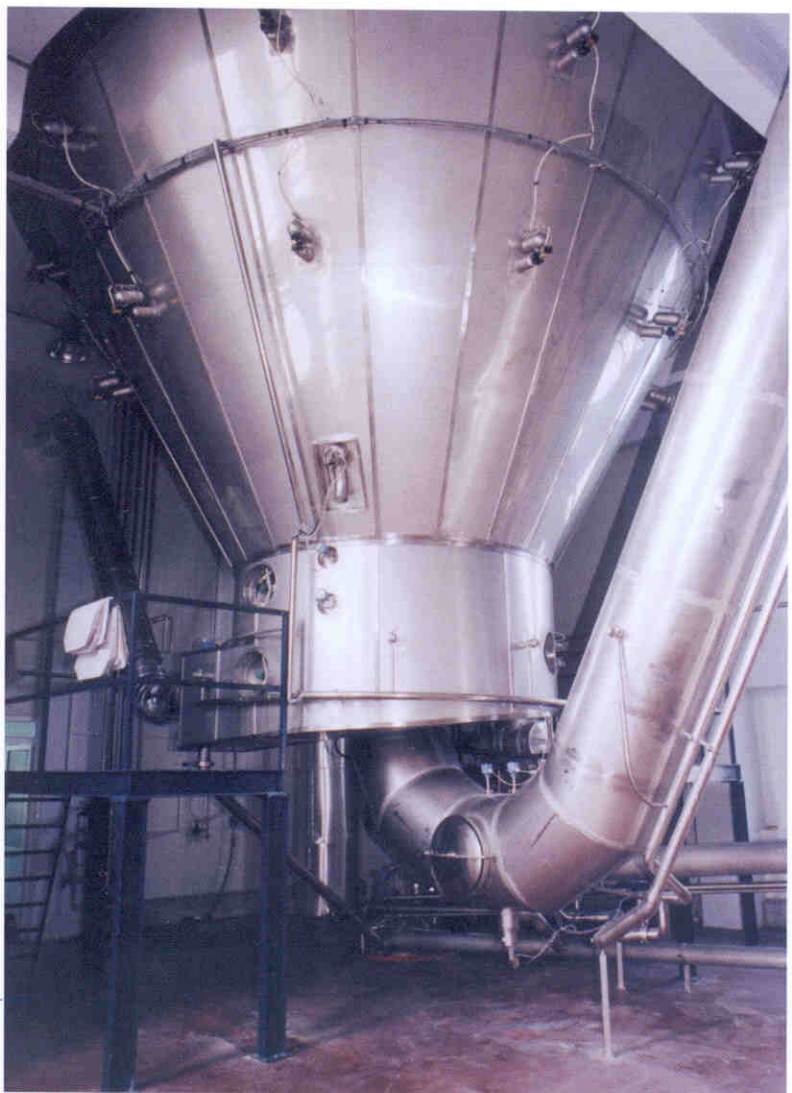
Niro COMPACT™ Spray Drying Plant with integrated fluid bed.



Crystallization tanks for permeate and/or whey concentrate.

Alternatively, the whey is evaporated, crystallized and dried directly, depending upon the current demand from the market.

From the spray dryer the product is bagged off in 25 kg bags in an AVALON packing line, also a member of the GEA Niro Group.





The CENTRAL PROTEIN SA factory at Karditsa in the region of Thessalia.

A modern CIP station was designed and supplied by GEA Liquid Scandinavia to ensure top hygiene in this new factory.

In order to support Hellenic Protein SA in the design, supply of utilities and building, erection of the process equipment and overall planning of the whole project, Niro Hellas ABETE (member of the GEA Niro Group) undertook the overall responsibility as main contractor for Hellenic Protein SA.

Central Protein SA – Karditsa

This plant was put into operation at the end of 1999. It is located in Karditsa in Central Greece, in the region of Thessalia, where a big number of dairies produces significant quantities of traditional Greek cheeses.

The CENTRAL PROTEIN SA factory is designed for processing of whey received in pre-concentrated form from the regions of Thessalia and Peloponisos. Further, liquid whey from a close-by Feta cheese factory is concentrated and dried in this plant, which has a daily capacity of approximately 300,000 kg/day of whey.

Whey reception, pretreatment and crystallization tanks were supplied by Niro Hellas ABETE under supervision of GEA Liquid Scandinavia. The evaporator, a 3-effect TVR plant with flash cooler, was designed and supplied by Niro France. The spray drying plant is of the same design as for Epirus Protein,

i.e. a Niro COMPACT™ spray dryer with integrated fluid bed and bag filter.

Utility supply, planning and erection of all the equipment was undertaken by Niro Hellas ABETE.

Macedonia Protein SA

This plant will be put into operation beginning of 2001. It will be located in Northern Greece, in the region of Thessaloniki, where a big number of dairies produces significant quantities of traditional Greek cheeses.

The plant is a copy of the Central Protein factory in Karditsa. Only this time Hellenic Protein adapted new technology for the spray dryer. They follow the trend in the indus-

try and will install a CIP-able Bag Filter to replace the cyclones.

Hellenic Protein even went a step further and decided to install a new generation of CIP-able Bag Filter, the SANICIP™ bag filter. The advantages of this new filter are many, as the spray dryer will operate more economically with savings in energy consumption, lower noise level, better control of finer particles and higher yield of raw materials meaning less effluent. Secondary advantages include reduced space requirement.

The Niro sanitary bag filter includes new features, such as internal CIP of the bags (patent pending) making it possible to reduce water and chemical consumption, and a newly developed purge air system (patent pending) without venturis allowing CIP of the clean air plenum of the filter. Further, the time it takes to dry out the filter bags is reduced.

Niro SANICIP™ Bag Filter. Clean air plenum.



Conclusion

The co-operation between Hellenic Protein and GEA Niro has been fruitful, and represents an example of how whey can be turned into a profitable venture. The products that are obtained makes it now possible to have a more steady supply of fresh Mizithra cheese for the Greek market. Furthermore, the environmental problems have been dealt with and the pollution greatly reduced. ■

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